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Assaults On Nursing Personnel

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requirements for the Nursing Honors Program

Abstract

Introduction: Nurses are frequent victims of workplace violence. Little research has been done that examines multiple factors related to assaults against nurses.

Purpose: The purpose of this study was to examine the relationship of the rate of physical injury assault against hospital nurses with characteristics of assailants, of the nursing workforce, unit types, and hospital types. By providing insight into the factors that are associated with assaults on nursing staff, hospitals may be able to develop initiatives that decrease the number of assaults or decrease the severity of injuries.

Methodology: This was a cross-sectional, correlational study based on unit-level analysis. A convenience sample of 372 eligible units in 33 hospital members of the National Database of Nursing Quality Indicators® (NDNQI®) were invited to participate. Eligible unit types included adult and pediatric medical, surgical, and medical-surgical, neonate, obstetrics, perioperative, psychiatric, and emergency services. Twenty-seven hospitals submitted data from 180 units. Data were collected under a protocol approved by the University of Kansas Medical Center's Institutional Review Board. Incidents of physical and sexual assaults were recorded in a log available at the nurses' station of each participating unit during October 2012.

Findings: The analysis revealed the frequency of assaults, the characteristics of the nursing staff most frequently assaulted, unit types on which assaults are most common, and characteristics of assailants. Teaching hospitals in this sample accounted for the most cases of assaults with 68.3% of the total reported, whereas non-teaching hospitals had 22% and academic medical centers 9.8% of the total incidents. Among unit types, neonate, pediatric and obstetric units reported no assaults. Emergency departments, adult and psychiatric units reported the most assaults. All reported assaults were of a physical nature. Out of 92 assaults, 24 resulted in injury, of which 23 were minor and 1 was moderate. Patients were assailants 89 times with the remaining 3 being visitors or other. Assailants were usually male (55.4%) and assaultees were usually female (66.3%). The assaultees were mostly registered nurses (78.3%).

Discussion: Most assaults on nurses occurred on adult medical and surgical units, psychiatric units, and in emergency services. Most assaults did not result in injury. Most assailants were patients. To reduce the incidence of assaults on nurses, hospitals could target interventions on these four unit types. Potential interventions could include implementing easy-to-use reporting systems, staff training on patient de-escalation, increase surveillance and security measures.

Disclosures: Research was sponsored by the NDNQI® under contract to the American Nurses Association.

Introduction

A hospital work environment places nursing personnel at risk for violence. Nurses are often exposed to patients who are upset, confused, or suffering from mental illness. These patients can express aggression. In addition to patients, visitors and coworkers are also possible perpetrators of assault. Workplace violence against nurses is a serious issue. Nurses may not feel safe enough to come to work and focus on providing quality care. Assaulted nurses might suffer from injuries, as well as have emotional consequences. These factors not only have consequences for nurses, but may impair the quality of care provided on the unit.

While previous studies have focused on characteristics of nursing staff or types of units, related to assault rates, little research has been performed that examines multiple factors related to assaults against nurses. The purpose of this study was to examine the relationship of the rate of physical injury assault against hospital nurses with characteristics of assailants, the nursing workforce, unit types, and hospital types.

Research Aims

The study addressed three research aims.

1. Describe characteristics of assault events:
 - a. Hospitals (teaching status)
 - b. Units (unit types)
 - c. Assaultees (gender, license type)
 - d. Assailants (gender, relationship: patient, visitor, coworker)
2. Describe the characteristics of assaults against nurses:
 - a. Number/rate of assaults

- b. Type of assault (physical/sexual)
 - c. Number/rate of assaults with injury
 - d. Level of injury (none, minor, moderate, major, death)
3. Examine the relationships between assailant and assaultee:
- a. Gender
 - b. Age

Literature Review

Nurses are frequent victims of workplace violence. As the incidence of workplace violence increases and nurses feel less safe at work, they may think of leaving their positions or call in sick more than if they had a safer work environment. In one study, most of the assaulted nurses reported being afraid to go to work. Nurses also referred to the emotional pain caused by these assaults, which goes underreported (McKinnon and Cross, 2008).

Quality of patient care is greatly influenced by nurses not being able to focus on their duties. Our society cannot afford to lose nurses to other jobs because there is already a shortage of nursing professionals. As assaults on nurses are increasing in number, research has examined the characteristics of the individuals and environments involved. However, little research has been conducted to analyze multiple factors related to workplace assaults (WPA).

Nurses are assaulted more than twice as often as any other health care worker. Nurses are also three times more likely to be assaulted in their workplace as any other profession (Campbell et al, 2011). Campbell et al. (2011), investigated the workplace violence risk factors that included gender, age, race, job experience and history of

childhood or adulthood abuse. Four institutions participated in the study, including a suburban facility, a geriatric facility, a large urban medical center and an affiliated community hospital. Participants reported experiences over a 12 month period via an online survey. Results revealed that 30% of personnel experienced work place violence (WPV). Assaults were most prevalent at the geriatric center and least common at the large urban facility. Almost all of the assailants were patients (90.2%), followed by patient relatives (27%) and then coworkers, physicians and supervisors. The findings indicate that nurses who were white, male, older, and those with a history of abuse were at the highest risk for workplace violence.

Similar conclusions were made by McKinnon and Cross (2008) regarding male nurses being more at risk for violence. Unlike the previous study, this research focused on occupational violence and assaults in mental health nursing. The respondents (n=90) from in-patient and community service healthcare employees completed a 16 item questionnaire. The respondents had a variety of skills and experience. All male employees responded that they had been assaulted while somewhat fewer female workers reported experiencing violence (83.7%). As in the Campbell study, the most common assailants were patients (88.9%), but sometimes their family members and friends were involved. Most assaults were verbal, but others involved physical injuries caused by punching, weapons and logrolling with the assailants.

Another risk factor in work place related violence that Nachreiner et al (2007) studied was nursing license type. They related the type of license, RN or LPN, to demographics, which in turn influenced behavior of individuals. A random sample of 6,300 Minnesota nurses self-reported via a survey their demographic information and

experiences for the previous twelve months. The findings indicated that LPNs were slightly more exposed to work violence than RN license holders when supervising patient care, and RNs were more susceptible while providing care. LPNs working with children were at a higher risk of being assaulted. These research findings are helpful because they further determine what kind of tasks and exposure to certain patient populations place the nurses at a higher risk for assaults.

When considering exposure to patient populations that present a higher risk, emergency department nurses stand out. Emergency departments (ED) treat a wide variety of populations. Statistically, nurses in emergency departments are at the highest risk. Due to a lack of reporting systems, the study by Gacki-Smith et al (2009) was conducted to investigate emergency nurses' experiences and perceptions of violence, the types and frequencies of assaults in the emergency departments, and contributing factors to ED violence. Representing all fifty states, 3,465 ED nurses completed an online survey regarding their experiences in the previous twelve months. The results of the survey showed what nurses believe are the precipitating factors that cause violence against them. Some of the factors included care of psychiatric patients in the emergency department, long waits to be seen, patients perceiving staff as uncaring, inadequate staff and lack of enforced visitor policies. Night and weekend shift nurses experienced violence more frequently than regular day shift nurses. Pediatric ED nurses were assaulted less frequently. Another finding indicated that there was less WPV occurring in facilities where policies were instituted to report violence and where there were initiatives put in place by the administration to reduce its incidence. Though this article focused on emergency department nurses, it provides insight into the above mentioned factors contributing to

violence towards nurses. Some of these factors are common to other nursing environments, though less frequent than in ED.

The Emergency Department Violence Surveillance (EDVS) study was launched in May 2009, and published by Institute for Emergency Nursing Research (2011). The purpose of this project was to investigate, on the national level, the extent of the occurrence of workplace violence toward emergency nurses from patients and visitors, the extent of underreporting of such instances, and reporting mechanisms used. The findings indicated that only the most serious incidents were reported, those causing death or serious injuries. Reasons found for the underreporting of verbal abuse and other, less serious physical abuse, are the nurses' belief that they are part of the job, that nurses would be considered inadequate if they were assaulted and because there is a lack of reporting systems. This report is a good resource for factors influencing the underreporting of incidences of assaults. This is important because violence will continue if there is not a good system in place to stop it.

Another perspective for identifying at risk factors focuses on the environment, community and the organizational structure where WPV took place. Evidence suggests that nurses in Canada experience the highest incidence of work related violence when compared to the nurses of similar, westernized, health care systems (Nursing Health Services Research Unit, 2008). Conclusions from the literature review indicate that the main source of physical violence are the patients, and that non-physical violence is most often inflicted by co-workers. The study further identified the factors that contribute to violence, such as nurse and patient characteristics, environment, community, and organizational structure.

It is evident that occupational violence presents a cost burden on healthcare institutions. Due to frequent assaults, sick leave utilization and medical expenses increase. Turnover rate is higher in institutions where work place violence is more common, which leads to the additional cost of replacing staff. The assaulted nurses do not always feel supported by the system which decreases their productivity and causes burnout. There is a need to address assaults on nurses in a more effective way to reduce occupational violence.

Methods

The study used a cross-sectional design. Data analyses were performed using descriptive statistics and correlations. This was a secondary analysis of data from the National Database of Nursing Quality Indicators® (NDNQI) that were used for an instrument development pilot study. Data collection for the pilot study was conducted in October 2012.

Sample

A convenience sample consisting of NDNQI® member hospitals was used for this study. Out of 33 member hospitals invited, 27 hospitals participated, submitting data from 180 units. Participating units were grouped according to type into seven categories: adult medical-surgical, psychiatric, post-operative, emergency departments, pediatric, neonatal and obstetric units (Table 1). The sample included teaching hospitals, non-teaching hospitals, and medical academic centers.

Measures and Procedures

For the purpose of this study, assaults were defined as any incident involving forcible, unwanted physical or sexual contact in the workplace, regardless of who carried out the assault and whether or not there was intent to harm. Only assaults against nursing personnel were counted, including all licensure types (registered nurse, licensed practical

nurse, mental health technician and unlicensed assistive personnel). Accidental contact was not considered an assault even if the nurse was injured. All assaults were reported to NDNQI, regardless of whether there was an injury involved or even though no incident report was filed.

Assault logs were placed at the nurses' station on each participating unit. During the month of October, 2012, assaulted nursing personnel recorded characteristics of incidents in the provided log (Appendix A). Assaultees recorded information as soon as possible after the assault in order to maintain data reliability. Site coordinators from each hospital input data from the logs into an electronic REDCap data collection form that was submitted to NDNQI.

Data Analysis

Descriptive statistics were used in this study. Information reported included type of assault (physical or sexual, or both); injury level (none, minor, moderate, major, death); characteristics of the assaulted nurse, such as license type (RN, LPN, MHT, UAP), employee status (hospital employee, contract), age and gender; and characteristics of the assailant (patient, visitor, or other; age and gender). Correlations were conducted between assailants' and assaultees' age and gender.

Results

Research Aim 1: Describe characteristics of assault events.

NDNQI member hospitals of all types were eligible for the study. Out of 27 hospitals that participated, 5 were medical academic centers, 10 teaching and 12 non-teaching hospitals. Only 8% of the participating medical academic centers reported assaults, while 14% of non-teaching and 44% of teaching hospitals recorded incidents (Graph 1).

Obstetric, neonatal and pediatric units had no occurrences of violence against nurses. All psychiatric units reported assaults, whereas 94% of participating emergency departments, 39% of adult medical-surgical units and 16% of peri-operative units recorded assaults (Graph 2).

Most of the assaultees were registered nurses (79%), followed by mental health technicians (10%), unlicensed assistive personnel (8%) and licensed practical nurses (3%) (Graph3). Males were assailants 60% of the time and females in 40% of incidents. Females were assaultees 79% of the time while males were assaulted 21% of the time (Graph 4).

Research Aim 2: Describe the characteristics of assaults against nurses.

Number of assaults varied depending on the type of unit. Adult medical type had the highest number (21) of units reporting a total of 39 assaults. Emergency departments (10) reported 17 incidents. Psychiatric units (8) reported 33 assaults, while peri-operative units (2) had only 3 cases. None of neonatal, obstetric and pediatric units reported assault occurrences (Table 2). All assaults were of a physical nature; none were sexual assaults. There were 92 total assaults of which 24 involved injuries. Only one assault caused moderate level of injury (on an adult medical-surgical unit) and 23 assaults led to minor injuries. Minor injuries were reported on adult medical-surgical (9), psychiatric (8), and peri-operative units (6). There were no injuries causing death (Table 3).

Research Aim 3: Examine the relationships between assailant and assaultee.

Correlations between age and gender of assailant and assaultee did not reveal any significant relationships (Tables 1 and 2). The mean age of assaultees was 37 years with the age range 23 to 59 years. Assailants' mean age was 52 years with ages ranging from 9 to 89 years.

Discussion

In this study, the frequency of assaults varied by the type of unit. Neonatal, pediatric, and obstetric units reported no assaults. This finding is not surprising due to the nature of patients on these units. On the other hand, emergency departments, psychiatric, and adult medical-surgical units reported the most assaults. Previous research findings indicate most violence occurs in emergency departments and psychiatric units. The high rate of assaults against emergency department nurses is understandable, due to fewer security measures, screening visitors and urgency of situations. Psychiatric nurses deal with patients with mental illness which places them in potentially dangerous situations. The surprising finding of our study is that the highest number of assaults occurred on adult medical-surgical units. This may have been related to the reduced amount of security for those units or the open door policy of these units. In addition, the findings could potentially be skewed due to a large number of these units participating in our research. Future research should be more representative of all types of units with larger sample sizes.

Though adult medical units reported the most assaults, there were over two times as many assaults per unit in psychiatric units as in any other type. These results relate to the mental and behavioral illnesses that psychiatric patients experience.

All reported assaults were of physical, not sexual nature. This was expected as there are more opportunities for physical assaults. Assaults rarely resulted in injury. Most of the injuries were minor. This result might have been different if we had a larger sample that included more emergency departments, and psychiatric and adult units. Also, with a longer

data collection period, it is likely that more incidents would be reported, including more frequent injuries.

Patients were assailants 97% of the time, followed by patients' family members and then coworkers. More than half of the assailants were male which supports the stereotypical beliefs, whereas two thirds of assaultees were female. There are a larger number of female nurses, which could have affected this finding. Most of the assaulted nursing personnel were registered nurses. Again, registered nurses represented the largest portion of the health care staff that provided care for patients.

Conclusion

Workplace violence against nurses is evident in this and previous studies. There are several issues associated with assaults that do not involve physical injuries. A poor work environment where nurses fear for their safety may lead to a poor quality of care and high nurse turnover, therefore decreasing patient satisfaction and positive outcomes, and increasing hospital cost. Further research is necessary to target reducing high risk factors in order to improve the nursing work environment. At the same time, nurses must be supported by their managers and encouraged to report all assaults. Nurses should be reminded that assaults are not part of their jobs and should not be tolerated.

Nursing Implications

One of the focuses of this study was to identify factors that increase nurse work place violence in order to plan and implement interventions to decrease its occurrence and consequences. Examining unit type differences in assaults on nurses will enable the development of targeted prevention strategies. Another important contribution is the development of a standardized tool for data collection on assaults. By establishing an

appropriate standardized data collection tool we will advance research to support improved nurse safety.

Further study should examine assaults on nurses in unit types with most frequent assaults, such as psychiatric, adult (critical care, step-down, medical-surgical, medical and surgical) and emergency departments. By identifying higher risk factors we can be more effective in preventing violence and injuries. In addition, assessment of security measures in the hospitals with the most frequent assaults would be important to investigate. Future research should include a larger sample size and longer data collection periods to increase validity and generalization of results. This approach will lead to the development and testing of interventions to prevent assaults on nursing personnel.

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Table1. Unit Types in Sample

Number of Units in each Unit Type	
Unit Type	Number of Units
Adult Critical Care, Step-down, Medical, Surgical, Med-Surg	99
Psychiatric	15
Peri-Operative	19
Emergency	18
Obstetrics	12
Neonate	9
Pediatrics	8
Total	180

Table 2. Characteristics of Assaults

Unit Type	Units w/ Assaults	Number of Assaults	Avg. Assaults per Unit	Physical Assault
Adult	21	39	1.86	39
Psych	8	33	4.13	33
Peri-Operative	2	3	1.5	3
Emergency	10	17	1.7	17
Obstetrics	0	0	0	0
Neonate	0	0	0	0
Pediatrics	0	0	0	0
Total	41	92	2.24	92

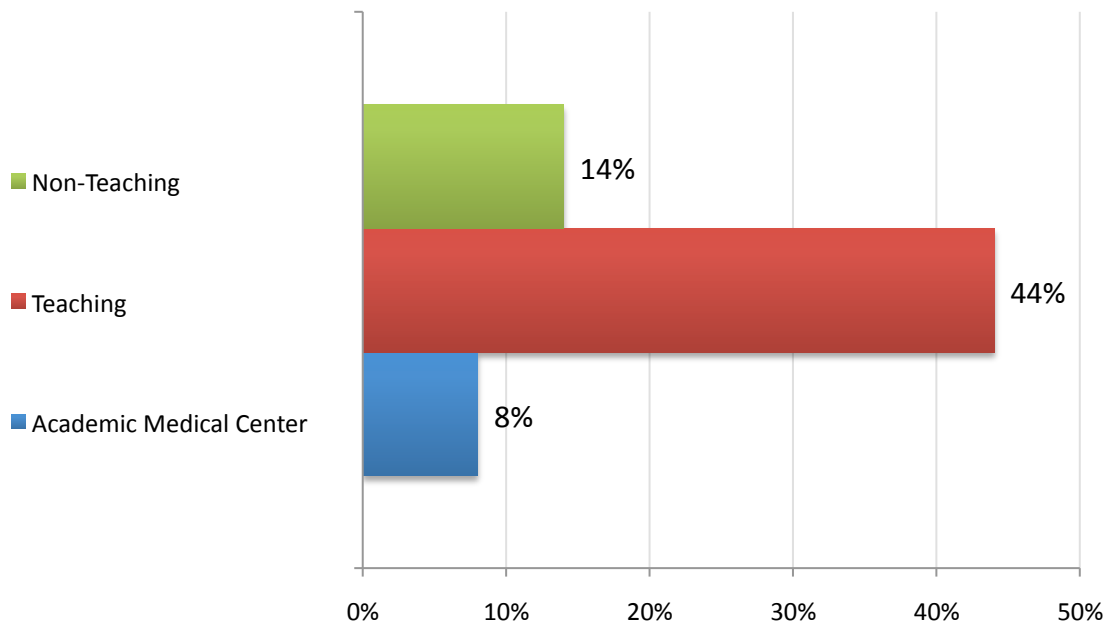
Table 3. Characteristics of Assault Injuries

Unit Type	#Assaults w/ Injuries	<u>Injury Level</u>	
		Minor	Moderate
Adult	10	9	1
Psych	8	8	0
Peri Operative	0	0	0
Emergency	6	6	0
Obstetrics	0	0	0
Neonate	0	0	0
Pediatrics	0	0	0
Total	24	23	1

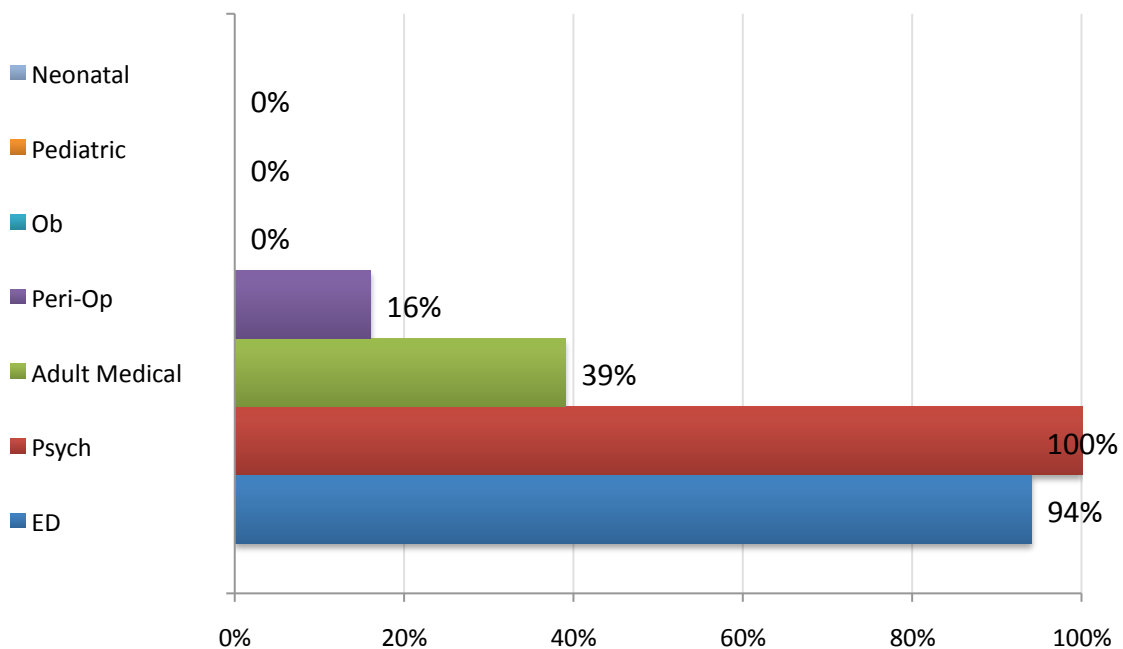
Table 4. Assailant and Assaultee Gender

Assaultee	Assailant		
	Female	Male	Total
Female	24 (41%)	34 (59%)	58
Male	4 (29%)	10 (71%)	14
Total	28 (39%)	44 (61%)	72

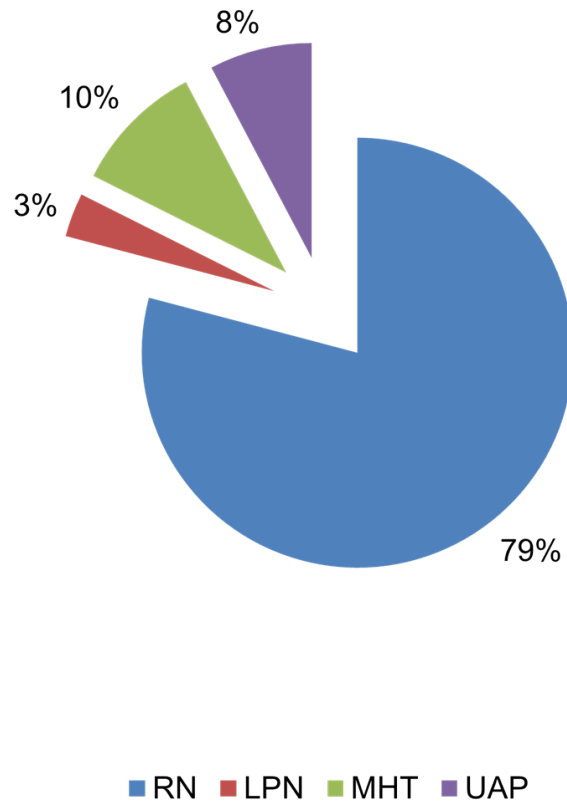
Graph 1. Percent of Units with Assaults per Hospital Type



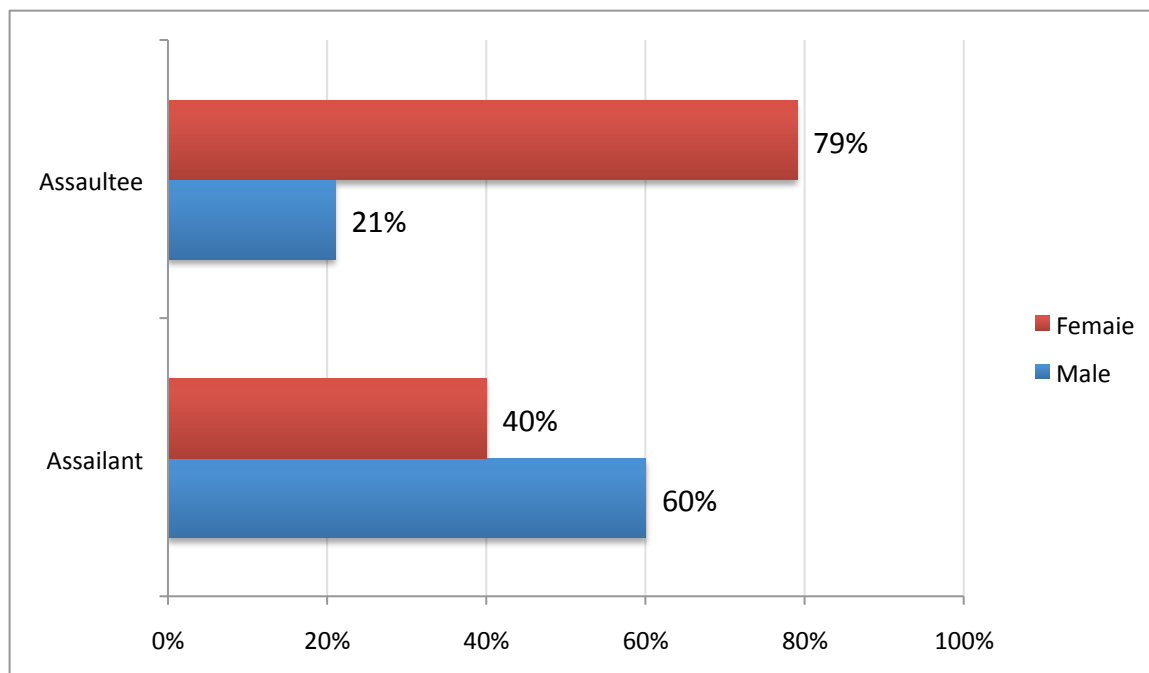
Graph 2. Percent of Units with Assaults



Graph 3. Assaultees by Licensure Role



Graph 4. Assailant and Assaultee by Gender



The Relationship Between RN Job Enjoyment and Intent to Stay: A Unit-Level Analysis

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Abstract

Job satisfaction is crucial for RN retention. Yet, little is known about the relationship between RN job enjoyment and intent to stay at the patient care unit level. This study examined the relationship between RN workgroup job enjoyment and RN workgroup intent to stay on five types of acute care hospital units. A descriptive, correlational design was employed using 2011 data from the National Database of Nursing Quality Indicators® (NDNQI®) RN survey. Two-level linear regression analyses were performed at the unit level. The sample consisted of 5,062 units (116,563 RNs; 723 hospitals). Included unit types were Critical Care, Step-Down, Medical, Surgical, and Medical-Surgical. Controlling for unit (nurse staffing, RN education, RN unit tenure) and hospital (Magnet status, bed size, teaching status, geographical location) characteristics, RN workgroup job enjoyment was positively associated with RN workgroup intent to stay across all five unit types. Findings from this study provide evidence that RN workgroup job enjoyment contributes significantly to RN workgroup intent to stay. Nursing administrators and managers wishing to achieve higher RN retention rates should develop strategies to enhance RN job enjoyment on a unit-by-unit basis.

Introduction

Registered Nurses (RNs) are essential care providers in acute care settings. Over the recent decades, recruitment and retention of qualified RNs have been challenging. The nursing shortage problem has been addressed in the literature, especially in regard to increased cost and patient care quality (Hayes et al., 2012). Research has demonstrated that a high nurse turnover rate is significantly associated with poor patient outcomes related to events including more frequent medication errors and patient falls (Bae, Mark, & Fried, 2010; O'Brien-Pallas, Murphy, Shamian, Li, & Hayes, 2010). Among efforts to develop nurse retention strategies, researchers have made investigations to identify factors related to nurse turnover. Findings from a systematic review of nurse turnover studies revealed that job satisfaction is an important factor influencing nurse turnover (Hayes et al., 2012). Due to the limitation of data availability for actual nurse turnover, it should be noted that many of these turnover studies use intent to leave or stay as a proxy measure of nurse turnover. However, the factors related to intent to leave may not be the same as those related to intent to stay. Relatively few studies to date have been conducted to examine factors related to intent to stay. Moreover, none of these limited studies have been conducted at the unit level.

The nursing unit is the operational level in which RNs provide direct care to patients. In recent years, unit-specific interventions and strategies have been recommended to improve patient care quality and safety. It would be beneficial to examine factors that may affect nurses' intentions to remain in their current positions at the unit level. Therefore, the purpose of this study was to examine the relationship of RNs' job enjoyment to their intention to stay in their current position at the unit level. Job

satisfaction is a multifaceted concept and can be categorized into two dimensions: cognitive and affective (Schleicher, Watt, & Greguras, 2004). The cognitive dimension of job satisfaction refers to the individual's views of job conditions. The affective dimension of job satisfaction refers to the individual's feeling of their job or job enjoyment. This study specifically examines the direct relationship of unit-level affective job satisfaction (RN workgroup job enjoyment) to unit-level intent to stay on critical care, step-down, medical, surgical, and combined medical-surgical units (RN workgroup intent to stay), while adjusting for other unit (nurse staffing, RN education, and RN unit tenure) and hospital (hospital size, teaching status, Magnet status, and geographical location) characteristics. We hypothesized that RN workgroup job enjoyment would have a positive relationship with RN workgroup intent to stay.

Literature Review

Factors Associated with Intent to Stay

A general approach for the literature review of this study is to evaluate studies examining factors of intent to stay as opposed to turnover or intent to leave. Relatively few studies on nurse intent to stay have been located in the literature. A variety of factors related to nurse intention to stay have been identified, including job satisfaction, supervisor support, autonomy, work environment, and demographics. Among factors identified in previous studies, job satisfaction has repeatedly been found to be related to RN intent to stay (Cowden & Cummings, 2012).

Many studies have found that RN job satisfaction is a strong predictor of RN intent to stay. A study that evaluated the relationship between nurse manager leadership and critical care nurses' intent to stay found that high job satisfaction was the most significant

contributor to high intent to stay at one's position (Boyle, Bott, Hansen, Woods & Taunton, 1999). This study used a sample of 255 staff nurses employed in intensive care units at 4 urban hospitals (Boyle et al., 1999). Gregory, Way, LeFort, Barrett and Parfrey (2007) also found that RN job satisfaction was positively associated with RN intent to stay. In their study, trust and satisfaction indirectly mediated the effects of organizational culture on intent to stay (Gregory et al., 2007). Applebaum, Fowler, Fiedler, Osinubi, and Robson (2010) determined that there is a direct relationship between job satisfaction and turnover intention. They issued a 36-question survey to medical-surgical nurses addressing their work environment and found that environmental factors, such as perceived stress and lighting, can negatively influence nurse satisfaction, and ultimately RN intent to stay (Applebaum et al., 2010). McCarthy, Tyrrell, and Lehane (2007) identified job satisfaction to be the most accurate predictor of intent to stay in their study. They distributed questionnaires to RNs at 10 hospitals throughout Ireland in order to investigate RNs' intent to stay or leave their current positions (McCarthy, Tyrrell & Lehane, 2007). Additionally, Tourangeau and Cranley (2006) found that as overall RN job satisfaction increased, RN intent to stay also increased. Their study was completed using the Ontario Nurse Survey (Tourangeau & Cranley, 2006).

Studies on nurse intent to stay have been conducted using data from individual RNs working in acute care hospital settings. At the individual RN level, higher RN job satisfaction was related to higher RN intent to stay their job (Boyle et al., 1999; Tourangeau & Cranley, 2006). In these studies, RN job satisfaction has been measured as overall job satisfaction using either a single question or a multiple-item questionnaire that reflects various aspects of work. No studies focusing on affective job satisfaction (i.e., job

enjoyment) were found in the literature. Moreover, none of the studies were conducted at the unit level.

RN job tenure and RN education level were related to intent to stay. Higher job tenure was related to higher RN intent to stay. For example, Tourangeau and Cranley (2006) found that the more years nurses reported being employed in their positions, the more likely they were to remain employed in that position until retirement. However, in this study, baccalaureate-prepared nurses were less likely to report that they would stay employed in their current positions. Shields and Ward (2001) also found that nurses with higher levels of education were less likely to remain employed at their current institution. Furthermore, in a study using data from 1,993 newly licensed RNs in 34 states, newly licensed RNs with a baccalaureate degree were found to be less likely to stay at their current positions than those with lower levels of education (Kovner, Brewer, Greene & Fairchild, 2009).

Hospital characteristics, such as hospital size, teaching status, and nurse staffing level, are important factors that have been examined in nurse turnover and intent to leave studies (Heinen et al., 2013; Staggs & Dunton, 2012; Stone et al., 2007). However, few studies have been found in which researchers investigated their associations with nurse intent to stay. In a study examining the differences between pediatric RNs' intent to stay in Magnet and Non-Magnet pediatric hospitals, nurses who work in Magnet hospitals were found to be more likely to stay with their current position (Lacey, Teasley & Cox, 2009). Little is known about how other hospital characteristics such as hospital size, teaching status, geographical location, and nurse staffing level, affect nurses' intent to stay with their current positions.

Conceptual Model of the Study

Based on findings from previous studies and available data from the National Database of Nursing Quality Indicators® (NDNQI®), the model tested in this study was developed to test the direct relationship between RN workgroup job enjoyment and RN workgroup intent to stay, while adjusting for other unit and hospital characteristics. In this model, unit characteristics represent unit workforce characteristics and include nurse staffing, RN education level, and RN unit tenure. Hospital characteristics include hospital size, teaching status, Magnet status and geographical location.

Methods

Data Sources and Sample

A descriptive, correlational design was used for this study. Unit-level data from 2011 on nurse staffing and hospital characteristics (hospital size, Magnet status, teaching status, and geographical location) were obtained from the NDNQI® database. These data were linked with the NDNQI® RN survey database to obtain 2011 data on RN job enjoyment, education, and unit tenure. The NDNQI® RN survey was conducted annually to gather information on job satisfaction, work contextual items (e.g., shift and overtime), and demographic characteristics from RNs employed in participating NDNQI® hospitals. Eligible RNs for the survey must spend at least 50% of their time providing direct patient care and must have worked in their current units for at least 3 months. In 2011, over 326,000 RNs participated in the survey, with a response rate of 69%.

The unit of analysis was the nursing unit, not the individual RN. The final analytical sample consisted of 5,062 adult care units in 723 hospitals. The sample unit was restricted

to five unit types: critical care (1,224 units), step-down (829 units), medical (969 units), surgical (751 units), and combined medical-surgical (1,289 units).

In the sample units, 116,563 RN respondents were included. The average age of the RNs was 41, and the average tenure on the current unit was 6.82 years. More than half of the RNs (57.52%) had a bachelor's or higher degree in nursing. About one-third of sample hospitals were Magnet hospitals, and had more than 300 staffed beds. Almost half of all sample hospitals were teaching hospitals. The geographical location of sample hospitals, as classified by four census regions, were as follows: West (15.08%), Midwest (26.56%), South (37.62%), and Northeast (20.75%).

Measures

RN workgroup intent to stay was measured using a single item from the NDNQI® RN survey: "what are your job plans for the next year?" The six response options were combined into two categories: stay in my current position = 1 vs. all others = 0. For this study, the percentage of RNs in each unit who intended to stay in their current position for the next year was computed.

RN workgroup job satisfaction was measured using the NDNQI-Adapted Job Enjoyment (JE) scale (Taunton et al., 2004). The JE scale consists of seven items to measure overall affective job satisfaction at the unit level. The items are scored using a 6-point Likert-type scale: 1 (strongly disagree) to 6 (strongly agree). For this study, the mean JE score for each RN was computed and then averaged across the RNs in each unit to obtain a unit-level JE score. The potential mean scores range from one to six and higher scores indicate higher RN workgroup job enjoyment. Reliability and validity of the JE scale have

been established at both the individual RN and unit level (Boyle et al., 2006; Taunton et al., 2004).

Other variables include unit (nurse staffing, RN education, and RN unit tenure) and hospital characteristics (hospital size, teaching status, Magnet status, and geographical location). Unit-level nurse staffing was measured as the average nursing hours per patient day (HPPD) for the year 2011 and included RN HPPD and non-RN (licensed practical nurse and unlicensed assistive personal) HPPD. RN education was measured as the percentage of RNs with a bachelor's degree or higher on the unit. RN unit tenure was measured as the average number of years RNs worked on the current unit.

Four hospital characteristics were included: hospital size ($<300 = 0$ and $\geq 300 = 1$), teaching status (teaching hospital = 1 and non-teaching hospital = 0), Magnet status (Magnet hospital = 1 and non-Magnet hospital = 0), and four census divisions as a measure of geographical location of hospitals (West, Midwest, South, and Northeast).

Analysis

Because of the nature of hierarchical data, multilevel modeling is a suitable statistical method to adjust for the clustering of units within hospitals. Two-level linear regression analyses were performed to examine the unit-level relationship between RN job enjoyment and intent to stay in their current jobs, while accounting for other variables (nurse staffing, RN education, RN unit tenure, and hospital characteristics). The model was tested separately for each of the five unit types. All data analyses were performed with IBM SPSS Statistics 20.

Results

Two-level linear regression models were estimated to examine the relationship of RN workgroup job enjoyment to RN workgroup intent to stay, adjusting for unit and hospital characteristics. Table 1 presents means and standard deviations for RN workgroup job satisfaction and RN workgroup intent to stay. Moderate unit RN workgroup job satisfaction was reported, ranging from an average of 3.63 for combined medical-surgical units to 3.73 for critical care units. RN workgroup intent to stay was highest on critical care units (77.60%) and lowest on combined medical-surgical units (70.99%). Table 2 presents the results from the five models tested separately by five types of units (critical, step-down, medical, surgical, and combined medical-surgical units).

Table 1 Registered Nurse (RN) Workgroup Job Satisfaction and Intent to Stay by Unit Type

Unit type	N	Job enjoyment	Intent to stay (%)
		<i>M (SD)</i>	<i>M (SD)</i>
Critical care	1224	3.73 (.54)	77.60 (13.85)
Step-down	829	3.64 (.54)	70.99 (16.36)
Medical	969	3.65 (.56)	72.06 (17.00)
Surgical	751	3.69 (.53)	75.05 (15.41)
Med-Surg	1289	3.63 (.53)	73.21 (15.92)

Controlling for unit (nurse staffing, RN education, and RN unit tenure) and hospital (hospital size, teaching status, Magnet status, and geographical location) characteristics, RN workgroup job enjoyment was positively associated with RN workgroup intent to stay across all five unit types. Among unit characteristics included in the model, RN workgroup

intent to stay was positively associated with RN unit tenure, and negatively associated with RN education level across all unit types. However, RN HPPD and Non-RN HPPD were not significantly associated with RN workgroup intent to stay except that Non-RN HPPD in Medical-Surgical units was negatively associated with RN workgroup intent to stay. Among hospital characteristics (Magnet status, hospital size, teaching status and geographical location) examined in the model, hospital Magnet status and geographical location were found to be significantly related to RN workgroup intent to stay. Only for surgical units, Magnet status was significantly and negatively related to RN workgroup intent to stay. For all unit types except surgical units, RN workgroup intent to stay was higher in the Northeast than West among four census regions.

Table 2 Results of RN Workgroup Intent to Stay Models by Unit Type

Variable	Critical (n=1,224)	Step-down (n=829)	Medical (n=969)	Surgical (n=751)	Med-Surg (n=1,289)
Workgroup Job enjoyment	17.31**	20.46**	19.06**	19.58*	18.57**
RN HPPD	.14	-.06	.59	-.28	.41
Non-RN HPPD	-.11	.06	-.12	-.44	-.79*
RN education level	-.10**	-.09**	-.11**	-.11**	-.08**
RN unit tenure	.70**	1.60**	1.40**	.95**	1.54**
Magnet	.08	-1.44	-.97	-2.25*	-1.05
Bed size	.48	.39	-1.34	1.00	-.14
Teaching	-.64	-.28	-.84	-.05	-1.01
Geographic Location					
West	Referent	Referent	Referent	Referent	Referent
Midwest	1.05	2.71	2.41	1.36	4.59**
South	.87	1.05	.87	-.76	2.72*
Northeast	3.97*	4.33*	4.03	-.13	4.28*

**p<0.001 *p<.05

Discussion

This study examined the direct relationship between RN workgroup job enjoyment and RN workgroup intent to stay. Results showed RN workgroup job enjoyment was the strongest factor affecting RN workgroup intent to stay. The retention of skilled nurses would be beneficial not only for the nurses themselves, but also for hospitals and patients (Hayhurst, Saylor & Stuenkel, 2004). Thus, efforts must be made to improve RN job satisfaction on a unit-by-unit basis. A large growing body of studies found that a supportive nurse work environment is one of the most important factors of nurse job satisfaction (Hayes et al., 2012). Nurse administrators and managers need to develop strategies for improving nurse work environments that ultimately affect nurses' job satisfaction as well as intent to stay at their current positions. More importantly, all of the strategies to improve RN job enjoyment and intent to stay should be tailored based on the nature of specific units.

The impact of nursing leadership and management on better nurse outcomes, such as nurse job satisfaction and intent to stay has been well documented in the literature. . Findings from a systematic review indicated that nursing leadership significantly affects staff nurses' intent to stay (Cowden, Cummings, & Profetto-Mcgrath, 2011). In this systematic review, while transformational or relational leadership styles have been found to related to greater intent to stay, task-focused leadership styles have been found to be related to lower intent to stay. Boyle et al. (1999) found that nurses who express high intent to stay at their current position also express high perceived influence of the nurse manager in regard to how staff perform their job and solve problems; high perceived ability of the manager to control others through the use of reward and punishment; and

high opportunities for promotion. Unit nurse managers should be aware of the importance of their leadership role to improve RNs' retention at their current job. Unit nurse managers can make a significant contribution to RN job enjoyment as well as intent to stay by listening to nurses' feelings about their job on specific patient care unit types and identifying what factors make them choose to stay in their positions. Furthermore, nursing administrators should develop strategies to select effective nurse managers and provide better training and support for nurse managers to develop their leadership skills. Despite the importance of nursing leadership's role, the relationship between nursing leadership and nurse workgroup intent to stay was not examined in this study because those data were not available. Further studies are needed to investigate such relationship.

Moreover, the relationship between Magnet status and RN workgroup intent to stay was found in an unexpected direction. RN workgroup intent to stay was lower in Magnet than non-Magnet hospitals, although this significant relationship was found in only surgical units. This is not consistent with outcomes in previous studies that found nurses working in Magnet hospitals were more likely to stay their current position (Lacey, Teasley & Cox, 2009). A growing body of literature has demonstrated that Magnet-recognized hospitals have better nurse and patient outcomes, including higher nurse job satisfaction, lower turnover, and lower mortality rates (Drenkard, 2010). Further research is needed to confirm a positive relationship between Magnet status and RN intent to stay at the unit level.

Limitations

This study has several limitations. Study findings may not be generalizable to all United States acute care hospital units because the sample units were restricted to only five

unit types. Moreover, although the NDNQI® database contains data from a nationwide sample of acute care hospitals, larger institutions tend to be over-represented in the NDNQI® database. In addition, other factors influencing RN workgroup intent to stay, such as supervisor support, autonomy, and workgroup cohesion, were not included in the tested model for this study. Further research is needed to explore possible factors that affect RN intent to stay and develop the comprehensive model of RN workgroup intent to stay.

Conclusion

This study is the first to examine the relationship between RN job enjoyment and intent to stay at the unit level. Findings from this study provide evidence to support the relationship between RN job satisfaction and intent to stay at the patient care unit level. Nursing administrators and managers striving for higher RN retention rates should focus on developing and implementing strategies to increase RN job enjoyment on a unit by unit basis.

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Is There an App For That? Developing an Evaluation Rubric for Apps for Use with Adults
with Special Needs

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Abstract

Background: Societal need for technological support constantly evolves. Many mobile applications (apps) are now easily accessible, especially for the special needs population. Little literature exists discussing the usefulness, value, and evaluation of applications in this population. Apps have the potential to enhance the independent lives of adults with Down syndrome. One example is iDress which provides the user with the temperature and the clothing selection that is appropriate for that temperature.

Purpose: The purpose was to identify apps that could enhance the lives of adults with Down syndrome.

Methodology: Apps were chosen based on ease of use and applicability to the population. A tool was developed previously based on Harry Walker's evaluation rubric. The tool provides evaluations in application, feedback, adjustability, ease of use, cost and benefit. Each app was scored 1-4 and an average of each area calculated. Qualitative data were gathered from participants (adults with special needs and family members). Participants selected from a convenience sample, were required to be English speaking and capable of touch technology.

Results/Conclusions: Through analysis of qualitative and quantitative data, conclusions were drawn that touch technology and the apps that use it, can be beneficial in the lives of adults with Down syndrome. Apps that were rated low were due to participants' inability to communicate and understand directions or physical inability to use touch technology. Adults that were able to participate in the study rated most apps useful and applicable to their daily lives, specifically iDress. Findings indicate that adjustments, based on participants verbal and education capabilities, are needed for apps to be fully effective in the target population.

Introduction

The world has entered a technology revolution with the invention of iPod and iPad technology. Technology is becoming highly accessible to all and has greatly affected how society exists. This large impact is only starting to become relevant in the special needs population and its need is proving necessary in the development and daily lives of this population in order to keep pace with our rapidly adapting society. The ease of using iPad technology is being used to enhance learning in all populations, especially young adults and children. Advancements seen in the apps created are able to improve the quality of life in people with disabilities by supporting them with communication, dressing, counting money, medication reminders, maintaining diet, and many other daily needs. Through this technology, people with disabilities are able to function in the world around them and become an active member of society. This technology affects not only the people with disabilities, but also their teachers, caregivers, and families. Parents are given tools to be able to intervene earlier to enhance their child's learning and increase their overall level of wellbeing. Through the internet, families are able to connect and communicate across the world to share stories and ideas to augment their loved one's learning. The hope is that soon a central repository will be developed where adults with disabilities and their families can find and evaluate apps useful for their unique circumstances.

Apps are useful for all children and adults. Educational apps for adults with disabilities may need to interact and provide feedback in different ways that target this populations needs in order to be beneficial. Apps in the special needs population focus on obtaining and adapting daily living skills such as counting money and communication so they are capable of participating in everyday activities. Apps developed for basic daily

living skills are not as abundant as traditional educational apps, but, are beginning to increase with demand.

Apps are published daily as technology increases and publication becomes easier. The research team's focus was on identifying apps and validating a tool to assist adults with special needs and their families to determine which apps are applicable to their daily lives. Some of these apps are free, whereas others can be hundreds of dollars. Apps were considered carefully to best support adults while being financially aware of the daily costs they already have.

The tool used in this pilot study was adapted to gain insight about the strengths and weaknesses of each app. The goal is to ultimately create a central repository where apps can consistently be added and evaluated to provide a way for adults with disabilities and their families to search for new ways to enhance their lives. The hope is that all adults with disabilities can reach their fullest capabilities, live independently, and be an active member of society (Buckler & Peterson, 2012).

Literature Review

Technology has gone through tremendous change within the past decade, creating an increased relevance for adults with special needs. Much of the research available has been focused on children with special needs, not adults. In our literature search, no research, other than a previous pilot study (Buckler and Peterson 2012), was found that evaluated the use of iPad apps on the lives of adults with disabilities. Buckler and Peterson (2012) used an evaluation tool and had ten adults with Down syndrome evaluate six apps. This pilot study used the same evaluation tool to evaluate additional apps for adults with

Down syndrome and their caregivers. The researchers evaluated and expanded on the articles from the previous literature review by Buckler and Peterson (2012).

To establish useful apps for the adults with special needs, an evaluation tool must be developed. According to Walker's article (2011) *Evaluating the Effectiveness of Apps for Mobile Devices*, apps can be examined for quality through usefulness, curriculum connections, ability to export/import, potential for collaboration, aesthetics, and stability. He also noted that the price of the app may not be linked to the quality of the app. Through the use and evaluation of more apps, a common language can be created to allow a greater understanding of appropriate apps for each individual. Walker (2011) created a rubric for teachers to evaluate apps usefulness based on six characteristics of an app that he concluded were important from his research. These characteristics included a) curriculum connections, b) authenticity, c) feedback, d) differentiation, e) user friendliness, and f) motivation. Walker's rubric is shown in Appendix A. His rubric was adapted for the previous pilot study and used again for this study. His permission was obtained and is shown in Appendix B. After an evaluation tool is developed, a central repository could be created in order to form a location where all apps beneficial to adults with Down syndrome could be accessed.

Technology has become more readily available and the price has continued to decrease. The main hope through the use of apps is to increase the independence of adults with disabilities. Apps can be used for a variety of purposes to enhance the lives of this population through aiding communication, time management, education, allowing alerts and reminders, monitoring safety, and guiding the individual and their families. Palmer, Wehmeyer, Davies, and Stock (2012), conducted a national survey of 1617 family members

of persons with disabilities. Their survey indicated that many family members with cognitive or physical impairment did not use assistive technology, but could benefit from it. Many also stated that complexity was not a barrier to their use of technology. Barriers identified leading to underuse are that devices commonly break, need set up, and are expensive.

Smart technology encompasses a large realm of different possibilities to aid in the independence of individuals in their home setting, ranging from controlling appliances to monitoring the individual's safety (Storey, 2010). Examples of smart technology include: computers, tablets, and smart phones which can be utilized, in addition to specific devices and monitors. Depending on the adult's individual requirements, different apps and technology can be made available to assist them in their unique needs. For example, web cams can track the adult in their household or a GPS tracker in their smart phone can alert their family when the adult has left their home. Alerts can remind the individual when it is time to complete an activity or take a medication. They can also alarm the family when a medication was not dispensed or alert the pharmacy when a new prescription needs to be refilled. Other technology is also available such as automatic vacuums and lighting to keep the individual safe as well as oriented.

For many adults with disabilities, remembering schedules and medication administration can be difficult. Through smart technology, schedules can be made for adults that can be shared and edited by their families as well. Alerts can be sent to the family member when the adult has an activity that requires assistance from someone else. Picture cues are a great aid in daily reminders that assist adults with disabilities that have a lower reading ability, helping to increase their independence.

Communication can be very complicated for adults with disabilities, adding to their reliance on others to complete activities and also causing social isolation. Smart technology allows a technological medium for augmentative and alternative communication (AAC). Through more mediums available, AAC software is becoming more extensive and available. Research with AAC has begun to show that adults with disabilities can have a range of vocabulary they are unable to verbally express. Through help from technology and a medium to express themselves, adults with disabilities are able to communicate with the world around them. This creates a large impact on the ability for this population to be active and independent in society. "Use of an SGD (speech generating device) can enhance the quality of life for persons with intellectual disabilities and severe expressive language disorders by providing a way to interact with familiar and unfamiliar communication partners" (Cheslock, Barton-Husley, Ronski, & Sevcik, 2008, p. 385). SGD may enhance their "...intellectual credibility as perceived and assessed by others" (Cheslock, Barton-Husley, Ronski, & Sevcik, 2008, p. 385).

Continuous education is necessary for all individuals. New skills and knowledge can be acquired with technology through computer-based instruction (CBI) and computer-based video instruction (CBVI) as stated by Ayres and Cihak (2010). Skills such as money management and proper hygiene can be acquired through these learning modules and applied to the individual's real life. Learning these life skills aids in allowing the individual to participate in their own lives and in society.

USA Today (2011) has alleged that iPads are successful within this population because they are lightweight, mobile, and can be personalized to the needs of the user. The use of touch screens can also be beneficial for adults that struggle with fine motor skills.

The iPad engages the user through the use of colors, sounds, and interactions. This draws in adults with disabilities attention. Through the use of iPads within this population, adults with disabilities can be connected to society as technology continues to develop.

“Although we do not need to predict the future, it is possible to offer some general guidelines for helping to guide development of smart technology supports for individuals with intellectual and developmental disabilities” (Storey, 2010, p.467). The goal is to establish apps on devices, such as tablets, that can establish independence and increase quality of life for adults with Down syndrome. Through adaptation of the tool used in the previous pilot study, apps can be evaluated and added to a central repository where adults with Down syndrome can discover new ways to develop their skills and reach their fullest potential.

Methodology

This study was submitted to and approved by the Institutional Review Board for Human Subjects at a midwestern university. The participants included adults with Down syndrome with varying degrees of disabilities, and their families, selected through purposive and convenience sampling. They were asked to participate in the study and completed the consent forms. The adults and families were required to speak English and be capable of using touch screen technology. The researchers provided the iPad and apps for evaluation. The research team was available to assist during evaluation if needed. Participants evaluated six different apps using the adapted evaluation tool created by researchers in the previous pilot study (Appendix C). They were provided the form and rubric to complete ratings for multiple domains on each app, and then asked to answer a selection of questions about the usefulness of iPad apps and the evaluation tool (Appendix

D). Apps evaluated included: Counting money, Proloquo2Go, iDress, and Telling Time, Now What, and Calorie Count. These apps focus on enhancing communication, education and activities of daily living. Evaluation of apps averaged around 15 minutes. Completion of the evaluation was anonymous with no personal information or identifying factors.

Evaluation scores were averaged and evaluated against hypothesized findings. Qualitative data were reviewed for themes. Data were compared to the previous pilot study and recommendations for the future were made.

Results

Results were gathered from a sample of ten pairs of adults with Down syndrome and their surrogates/caregivers. The end results are displayed in Appendix E.

The app that was considered most applicable and easy to use by the adults was iDress. Counting Money was rated as the least applicable and easy to use for adults with Down syndrome. All apps rated high on feedback and adjustability overall. Apps were considered cost effective except for Proloquo2Go which rated least cost effective. Most apps were rated as beneficial for adults with Down syndrome. Counting Money had a variety of ratings for the benefits domain.

Overall ten participants stated they thought some of the apps would be helpful to them or their adult, whereas only three said they would not be. Eleven said their adult could use at least one of the apps compared to two who stated they could not. Participants tended to like iDress the best. All but one subject who answered the qualitative questions said other adults with disabilities could benefit from the study apps. Most were unable to state other apps to investigate. Apps known to participants included location and sign language apps. Eight participants did not own an iPad or iPod, versus five participants who

did own an iPad or iPod. Only two stated that the tool used was not adequate in providing enough information to decide how to rate and evaluate the apps. No feedback was given for ways to improve the tool.

Discussion

Quantitative data were compiled related to the application, feedback, adjustability, ease of use, cost, and benefits of the apps for each adult with Down syndrome. All caregivers completed the evaluation tool. Few adults with Down syndrome were able to evaluate the results themselves. Those who were able were asked the questions as the researcher filled out the evaluation for them. Non verbal adults and adults with physical disabilities had difficulties using the apps, causing low scores from the surrogates/caregivers and no rating from the adults for many apps. Many of these caregivers/surrogates stated in the qualitative section that many of these apps may be more beneficial for other adults with less severe disabilities. Some apps may also have been ranked lower due to misunderstanding of the evaluation rubric. There was some missing data, especially for feedback, possibly due to misunderstanding of this domain. In one case, *Proloquo2Go* was not rated because the adult was verbal and *Now What* was not rated due to the adult already using a different scheduling program.

A qualitative analysis was also completed on the six short answer questions that evaluated the apps. Through these questions researchers were able to identify participants' opinions about apps usefulness in the adult with Down syndrome population. All participants except one said that their adult or other adults they know with Down syndrome could benefit from the use of these apps. Apps that were rated lower commonly were due to the adult's inability to communicate, complications from physical disability

and inability to use touch technology, or dementia. Only four participants were aware of other apps available that they recommended. This demonstrates the lack of use and awareness of touch technology for this population. Two suggestions for apps to be created are an app for learning sign language for non verbal adults and an app that shows pictures of favorite locations around town. This app could be used for the adult to pick a location they want to go to. There were two participants that stated they might acquire a few of the apps, such as iDress, Telling Time, and Now What, for their use at home.

Another problem identified was the number of families that owned touch technology. Many adults with disabilities must first learn the fine motor skills involved in touch technology before applications can be useful. Additionally, adults that are non-verbal tend to have a more difficult time understanding the educational apps. Apps with more pictures and less use of touch were identified as more realistic to implement in the daily lives of adults with Down syndrome.

Overall, most participants believe that the evaluation tool is useful and beneficial for assessment of the apps. Some low scoring results, specifically in the cost category, could be due to misunderstanding of the evaluation rubric. Many participants took under one minute to read the evaluation tool and rated each evaluation domain (application, feedback, adjustability, ease of use, cost, benefits) using a one to four scale, with four being the best. The scores ratings ranging from 1-4 also caused confusion in comparison to making the scores range from 1-5. Adjustments and clarification to the evaluation rubric could be made for future studies.

There were a few limitations identified within the study. First, the size of the sample was small and therefore generalization cannot be made. There were also a limited

number of adults that could use touch technology to evaluate the apps themselves.

Reasons for these complications included dementia, problems with communication, and physical disability. Exact usefulness in this population can be difficult to conclude due to the limited number of participants that could assess the apps themselves.

Conclusions

Through analysis of qualitative and quantitative data, conclusions can be drawn that touch technology can be beneficial in the lives of adults with Down syndrome. The evaluation tool can be effective in assessing each application; however adjustments to make it more user friendly should be made in the future. Apps that were rated low were due to participants' inability to use touch technology, inability to communicate, or physical disability. Many caregivers of these participants stated that apps could be applicable to other adults with a lower degree of disability. Most adults and caregivers who were able to use the apps rated them at higher levels and stated their potential usefulness in their daily lives. A larger sample size needs to be used for further research in order to obtain more data that can be generalized. The study can also be expanded to include all adults with disabilities. Lastly, touch technology and the use of apps need to be implemented into the education and daily use of adults with disabilities in order to fully understand their usefulness.

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Appendix A Evaluation rubric for iPod apps (Walker, 2010)

Evaluation Rubric for iPod Apps

Domain	1	2	3	4
Curriculum Connection	Skill(s) reinforced in the app are not clearly connected to the targeted skill or concept	Skill(s) reinforced are prerequisite or foundation skills for the targeted skill or concept	Skill(s) reinforced are related to the targeted skill or concept	Skill(s) reinforced are strongly connected to the targeted skill or concept
Authenticity	Skills are practiced in a rote or isolated fashion (e.g., flashcards)	Skills are practiced in a contrived game/simulation format	Some aspects of the app are presented in an authentic learning environment	Targeted skills are practiced in an authentic format/problem-based learning environment
Feedback	Feedback is limited to correctness of student responses	Feedback is limited to correctness of student responses and may allow for student to try again	Feedback is specific and results in improved student performance (may include tutorial aids)	Feedback is specific and results in improved student performance; Data is available electronically to student and teacher
Differentiation	App offers no flexibility (settings cannot be altered)	App offers limited flexibility (e.g., few levels such as easy, medium, hard)	App offers more than one degree of flexibility to adjust settings to meet student needs	App offers complete flexibility to alter settings to meet student needs
User Friendliness	Students need constant teacher supervision in order to use the app	Students need to have the teacher review how to use the app on more than one occasion	Students need to have the teacher review how to use the app	Students can launch and navigate within the app independently
Student Motivation	Students avoid the use of the app or complain when the app is assigned by the teacher	Students view the app as "more schoolwork" and may be off-task when directed by the teacher to use the app	Students will use the app as directed by the teacher	Students are highly motivated to use the app and select it as their first choice from a selection of related choices of apps

<http://learninginhand.com/storage/blog/AppRubric.pdf>

Created by Harry Walker – Johns Hopkins University

10/18/2010

Please contact for permission to use hwalker@bcps.org

**Appendix B Email correspondence with Harry Walker for permission to adapt rubric
(Buckler & Peterson, 2012)**

From: Moya Peterson [mailto:MPETERSO@kumc.edu]

Sent: Thursday, February 09, 2012 5:38 PM

To: Walker, Harry C.

Subject: your evaluation for iPod apps

Sir- I am an assistant professor at the University of Kansas School of Nursing and School of Medicine. I have established an Adults with Down Syndrome Specialty Clinic. A student and myself are attempting to find and evaluate apps on the iPad and iPod touches that my patients would benefit from as well as be able to inform parents and other providers of apps that are established that could assist them in their activities of daily living. We have used your evaluation tool as a pattern but have changed it somewhat to fit our particular needs. I have attached this tool to this email. I just wanted to make sure that we had your permission to do this. We were thrilled to find your tool, as there is very little in the literature about this. We thought it valuable and it provided the only suggestion to develop the tool that we wanted.

Please feel free to email me any questions you may have. Thank you for consideration of this matter. We will be anxious to hear back from you.

Moya Peterson, PhD, APRN

From: Harry Walker

Sent: 2/10/2012 10:15:22 AM

To: Moya Peterson

Hi Moya,

I'm glad you found the rubric to be useful. You have permission to use the rubric as described in your email. I will likely be in touch sometime in the coming month to ask for formalized feedback as part of my dissertation research at Johns Hopkins. I hope you will be able to participate. Best of luck in your efforts to get mobile devices in the hands of your patients.

You might also want to check out our blog - <http://iteachthererforeipod.blogspot.com> It has resources, articles, etc., related to iPods, Mobile 1 to 1 and BYOT. Feel free to share with like minded folks. There is also a link to an article I wrote for the Journal of Special Education Technology about the rubric. The background material may help in your work.

Regards,

Harry Walker

Appendix C Quantitative Evaluation Rubric

Please use the provided rubric to rate each iPad application:

Domain/APP	Counting Money	Proloquo2Go	iDress	Telling Time	Now What	Calorie Count
Application						
Feedback						
Adjustability						
Ease of Use						
Cost						
Benefits						

Evaluation of Applications

Domain	1	2	3	4
Application	Skills in the app are not applicable to individual's needs	Skills in the app are somewhat applicable to individual's needs	Skills in the app are adequately applicable to individual's needs	Skills in the app are very applicable to individual's needs
Feedback	No feedback is provided in the app	Feedback is only given regarding correctness of response	Feedback gives correctness of response and allows individual to try again	Feedback given is constructive and contributes to improvement of the task
Adjustability	App settings are not adjustable to individual's needs*	App settings are somewhat adjustable to meet individual's needs	App setting are adequately adjustable to meet individual's needs	App is very adjustable to meet individual's needs
Ease of Use	Individual needs maximum (step-by-step) instruction to use app	Individual needs moderate amount of instruction to use app	Individual needs minimal amount of instruction to use app	Individual needs no instruction to use app
Cost	Cost of app largely outweighs benefit of use	Cost of app somewhat outweighs benefit of use	Cost of app is equal to benefit of use	Benefit of use largely outweighs cost of app
Benefits	App provides no benefit to individual's daily life	App provides minimal benefit to individual's daily life	App provides some benefit to individual's daily life	App provides large benefits to individual's daily life

11/13/11

*Examples of needs include: larger fonts, volume control, larger graphics, difficulty levels, etc

Appendix D Qualitative Evaluation Rubric

Please answer the following questions:

Every participant will be asked to score each app on the following tool.

Every participant will be asked to answer the following questions:

1. Do you think any of these apps would be helpful to you or your adult?
2. Do you think that you or your adult could use any of these apps?
3. Do you think other adults that you know would benefit from these apps? How?
4. Are you aware of any other apps we should investigate?
5. Do you or someone in your family own an iPad or iPod? If no, have you thought about the purchase of one or such technology that is similar?
6. Do you think that this tool adequately evaluates the app and gives you the information you would need to make a decision on the app's use for you or your adult?

Appendix E Results

Domain/App	Counting Money	Proloquo2go	iDress	Telling Time	Now What	Calorie Count
Application	2.3	2.5	3.5	2.7	2.5	2.7
Feedback	3.1	3.6	3.9	3.4	3.2	3.5
Adjustability	2.3	3.0	3.1	3.0	3.0	3.3
Ease of Use	2.4	2.8	3.5	3.1	2.6	2.6
Cost	3.5	2.2	3.8	3.5	3.5	3.7
Benefits	2.7	3.2	3.5	3.2	3.0	3.3

*Costs: Counting Money \$0.99, Proloquo2Go \$189.99, iDress \$1.99, Telling Time \$0.99, Now What \$0.00, Calorie Count \$0.00

1. Do you think any of these apps would be helpful to you or your adult?

Yes: IIIIIIIII

Specific comments: iDress/telling time, especially idress, no computer access at home

No: II, I-Not at this stage in life with dementia

2. Do you think that you or your adult could use any of these apps?

Yes: IIIIIIIII

Specific comments: iDress, considering purchasing, no computer access at home

No: II

3. Do you think other adults that you know would benefit from these apps? How?

Yes: IIIIIIIIIII

Specific comments: proloquo2go, all seem quite beneficial to adults with Down syndrome, every aspect, calorie count could help everyone

No: I

4. Are you aware of any other apps we should investigate?

Yes: IIII

Specific Comments: different location apps, sign language

No: IIIIIIII

5. Do you or someone in your family own an iPad or iPod? If no, have you thought about the purchase of one or such technology that is similar?

Yes: IIIII

Specific comments: caregiver has i-pod

No: IIIIIIII

Specific comments: have considered it but have not made a purchase yet, may purchase one

6. Do you think that this tool adequately evaluates the app and gives you the information you would need to make a decision on the app's use for you or your adult?

Yes: IIIIIIII

Specific comments: owns a touch

No: II

Specific comments: difficult to understand

Emotional Tone Coding Using an Abbreviated Rating Scale

Rebecca Sims, BSN Honors Student

Kristine Williams, RN PhD, FGSA, FAAN, Faculty Advisor

Ruth Herman, PhD, Faculty Advisor

Submitted to the University of Kansas School of Nursing in partial fulfillment of the
requirements for the Nursing Honors Program

Abstract

Introduction: The Emotional Tone Rating Scale (ETRS) is used to evaluate nursing communication with older adults in dimensions of care, respect, and control. Psychometric analysis of the original scale indicates that several of the 12 items overlap and that two, instead of three factors are indicated (control and person-centered). A scale was reduced to 8 items to diminish redundancy and reduce burden for raters.

Background: This Pilot Study is part of a larger research study entitled Changing Talk to Reduce Resistiveness to Dementia Care. The specific aim of the larger study is to improve staff communication with nursing home residents who have dementia to reduce resistiveness to care (RTC). The intervention is a three-session staff training program on communication skills associated with avoiding RTC. The ETRS is used to evaluate the communication skills.

Purpose: This study was conducted to evaluate whether the 8 and 12 item scales measure the same factors.

Theoretical Framework: The ETRS is designed to measure nursing communication based on concepts and theories of person-centered care for older adults.

Methodology: Twenty raters each listened to 20, 1 minute audio recordings of nursing home care, presented in a powerpoint presentation. These clips were previously rated using the 12-item scale. They rated the nurse's communication on the ETRS. Factor analysis was used to compare similarities of the original and abbreviated scales.

Findings: Factor analysis revealed that the 12-item scale data and the 8-item scale data resulted in highly comparable negative correlations between person-centered and controlling scales. Factor analyses of the original 12-item scale and the 8-item scale produce similar solutions.

Discussion: The two factors person-centered communication and controlling communication are similar with the shortened 8-item tool as with the previous 12-item scale the shortened version and will be used for future use. This shortened scale will help to reduce redundancies and rater burden.

Introduction

Literature Review

Research has been conducted to examine communication with older adults. The Communication Predicament of Aging Model (see figure 1) discusses how individuals adapt their communication styles when conversing with older adults (Ryan, Hummert, & Boich, 1995). This adaptation is done as a compensation method due to the stereotype of older adults being incompetent. The compensation methods used are oversimplified speech or baby talk. Research has shown that these communication styles negatively impact the self-esteem and psychosocial needs of older adults (Ryan, Hummert, & Boich, 1995). The Emotional Tone Rating Scale is a means of analyzing communication with older adults. Care providers can then be made aware of their behavior and educated to modify how they speak with older adults, thus reducing the negative consequences seen with oversimplified speech and baby talk.

Background

This Pilot Study is part of a larger research study entitled Changing Talk to Reduce Resistiveness to Dementia Care. The specific aim of the larger study is to improve staff communication with nursing home residents who have dementia to reduce resistiveness to care (RTC). The intervention is a three-session staff training program on communication skills associated with avoiding RTC. The ETRS is used to evaluate the communication skills.

The Emotional Tone Rating Scale is a tool used to analyze the qualities of communication with older adults. This scale can be used by nurses and nursing assistants to analyze and self-monitor their communication with older adults in a variety of settings

including long term care facilities and hospitals. The Emotional Tone Rating Scale was originally developed to measure affective qualities or dimensions of care, respect, and control that are frequently unbalanced in communication with older adults, especially in nursing home settings. The scale can be used by naïve raters without training and with high levels of agreement. However, psychometric analysis of the scale revealed two, not three dimensions. The two dimensions were named person-centered and controlling.

Original 12-item scale ratings demonstrated high levels of agreement = 0.95 and consistency = 0.95 with 2 factors, “person-centered” and “controlling” that explained 84.8% of the variance. “Person-centered” factor loadings ranged from 0.84 to 0.98 with a coefficient alpha of 0.98. “Controlling” factor loadings were -0.63 to .99 with a coefficient alpha of 0.94. The two factors were negatively correlated $p = -0.64$ and demonstrated good ranges, standard deviations, and high item-total correlations. The items addressed on the 12-item scale were: nurturing, directive, affirming, respectful, patronizing, supportive, polite, bossy, caring, dominating, warm, and controlling.

Purpose

To reduce rater burden and time to complete ratings, we sought to decrease the number of items in the scale. Also, redundant items were removed. The purpose of the Emotional Tone Rating Scale is to allow nurses and nursing staff to effectively analyze their communication with older adults. For this rating scale to be effective it needed to be easy to use and free of any burden. This research project reduced the original 12-item scale to the new 8-item scale.

Methodology

Twenty raters were recruited from a university medical center campus using signs posted in public areas and a social media post on the university Facebook page. These raters were selected on a first come first serve basis to participate in this human subjects committee approved research study. The average rater was a 22-year female Caucasian college student with older adult care experience (see table 1).

These twenty raters listened to twenty audio clips recorded during nursing home care sessions. These clips varied in length with the average length of time being one minute long. These clips were previously rated using the 12-item scale. The participants rated the nurse's communication using the 8-item Emotional Tone Rating Scale. The new 8-item scale included these items: directive, respectful, supportive, polite, bossy, caring, dominating, and controlling. The items that were eliminated from the previous scale were the items nurturing, affirming, patronizing, and warm. The items eliminated either did not fit within the selected dimensions or produced redundancy with other items. The five point Likert scale was used to evaluate to what degree the communication fit the 8 items (1= not at all; 5=Very).

The audio clips were heard by way of a Powerpoint presentation which made it easy for raters to progress through the audio clips. The presentation included each audio clip twice so the participants could accurately rate the communication. Following participation in the research session the participants were given \$25 Visa cards for their time and effort.

Results

Factor analysis revealed that the 12-item scale data (Williams, Herman and Bontempo, 2012) and the 8-item scale data resulted in highly comparable negative

correlations between person-centered and controlling scales (-0.6992 for 12-item and -0.6987 for 8-item data ratings respectively). These findings replicate the two-factor ETRS model suggested in earlier research (Williams, Boyle, Herman, Coleman and Hummert, 2012). Factor analyses of the original 12-item scale and the 8-item scale produce similar solutions. See Figure 2: 12-item Scale results and Figure 3: 8-item Short Form results.

Discussion

The Emotional Tone Rating Scale ratings are similar with both the original 12-item scale and the abbreviated 8-item scale, resulting in a distinct and easily interpreted two-factor solution. The controlling factor included the items controlling, dominating, and bossy. The person centered factor included the items caring, supportive, polite, and respectful. Further evaluation of the “Directive” item is needed due to cross factor loading. Using this shortened scale may reduce redundancies and rater burden. The Emotional Tone Rating Scale can be used to evaluate the use of person-centered communication between staff and residents in long term care facilities in research and clinical practice.

Acknowledgments

1. Statistical analyses were supported by the National Institute of Deafness and Communication Disorders (P30DC05803). Statistician, Daniel Bontempo PhD, University of Kansas.
2. This project used data from a study supported by the National Institutes of Nursing Research, National Institutes of Health, NR009231-02, Elderspeak: Impact on Dementia Care, K. Williams, PI. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

Figure 1: Features and functions of patronizing communication within the Communication Predicament of Aging Model (Ryan, Hummert, & Boich, 1995, p. 147).

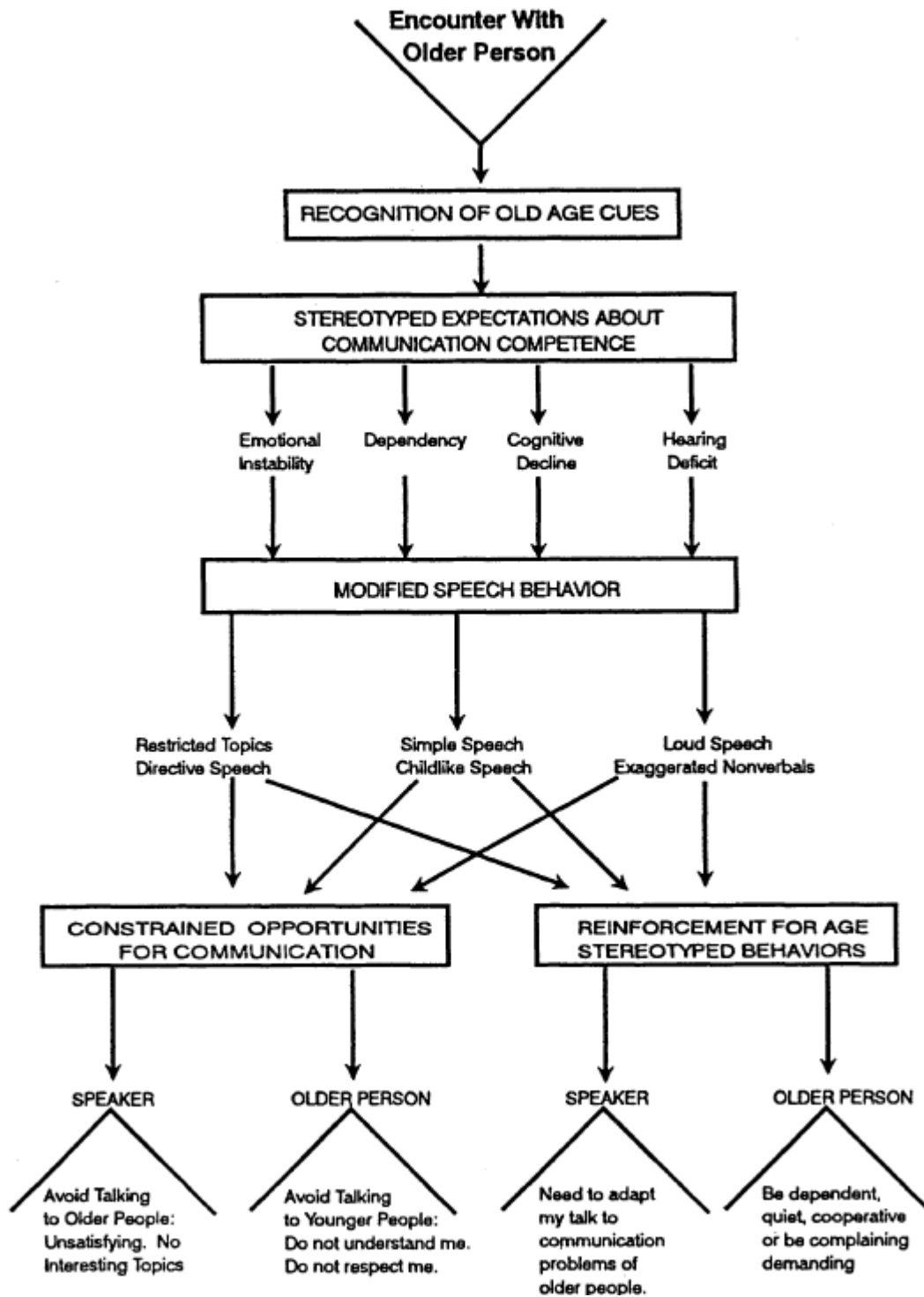
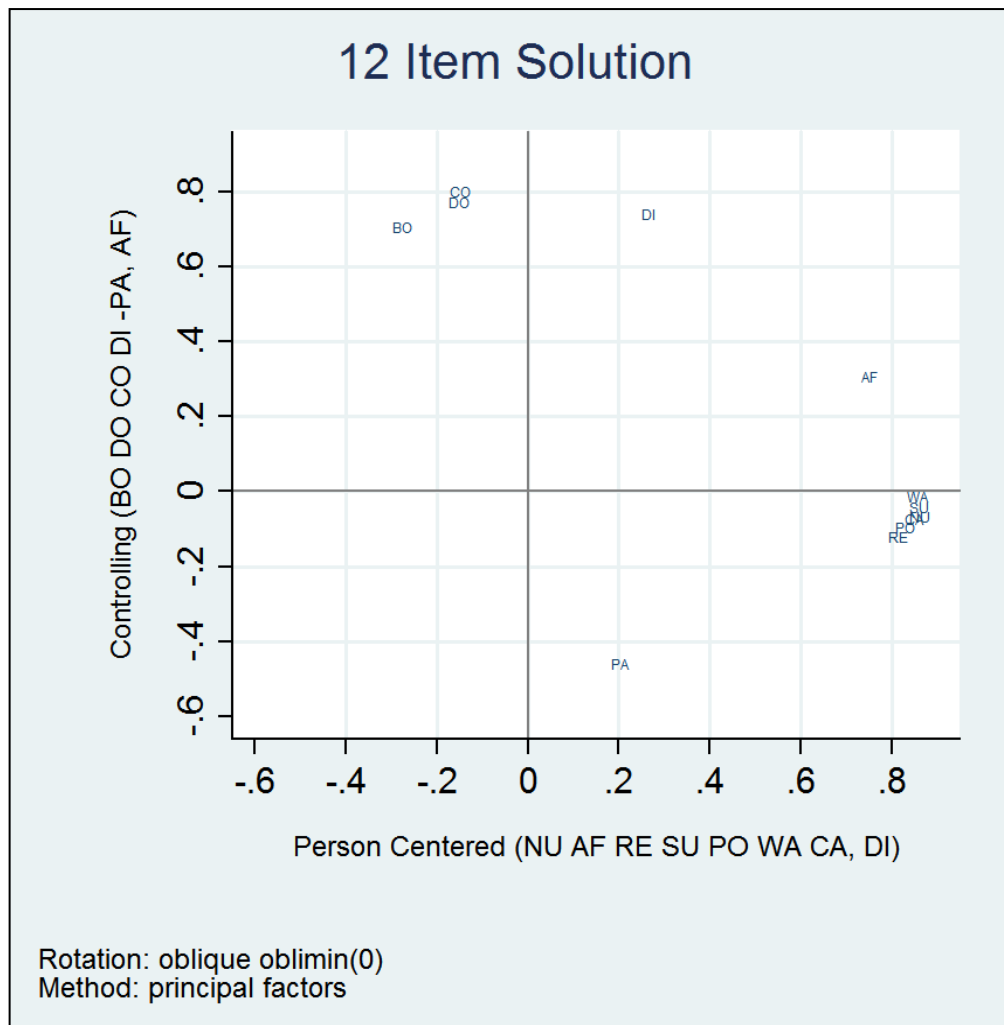


Table 1: Demographics of Raters

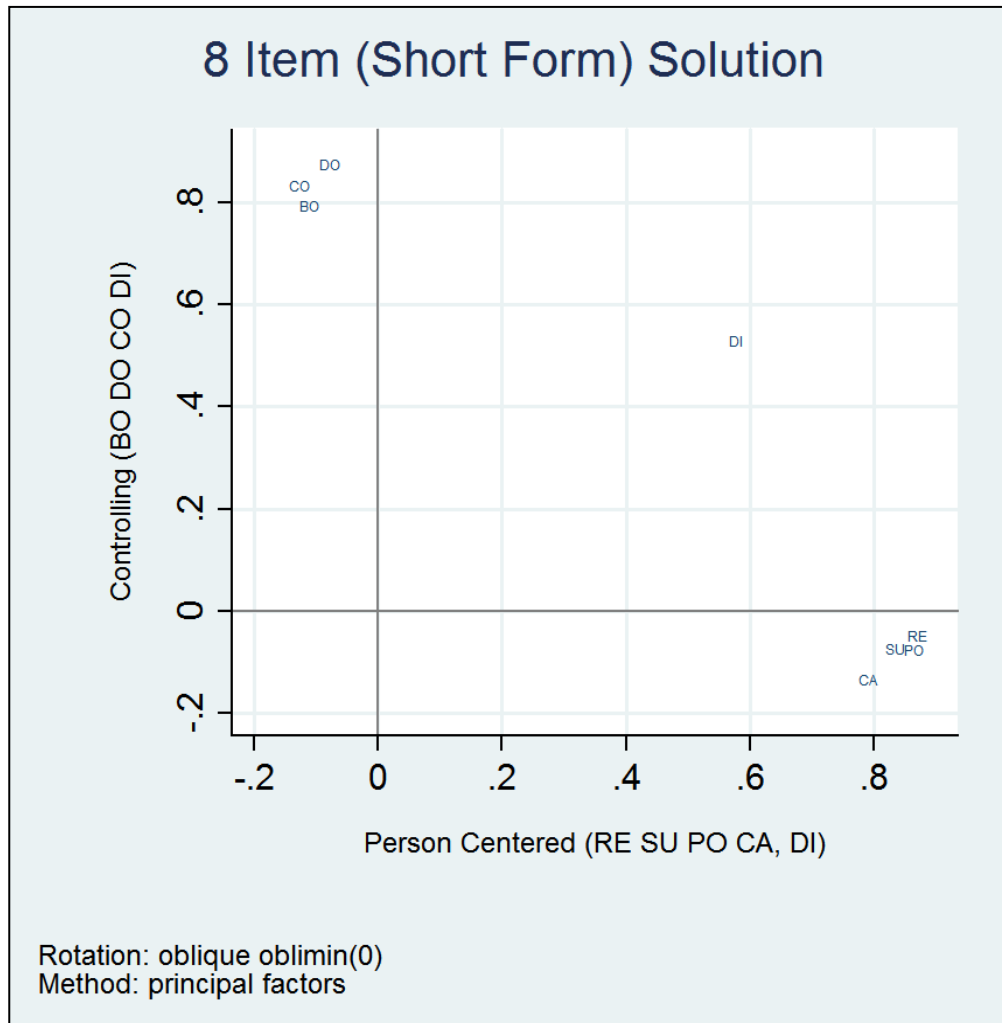
Age	Range of ages: 20-38 Average Age: 22.85
Race	White: 85% Asian: 10% Hispanic/Latino: 5%
Gender	100% Female
Highest Level of Education	College Sophomore: 25% College Junior: 65% Undergraduate degree: 10%
Previous experience working with older adults	80%

Figure 2: 12-item Scale Result



Key: CO= Controlling, DO= Dominating, BO=Bossy, DI=Directive, AF =Affirming, PA=Patronizing, NU=Nurturing, WA= Warm, CA=caring, SU=Supportive, PO=Polite, RE=Respectful

Figure 3: 8-item Short Form Results



Key: CO= Controlling, DO= Dominating, BO=Bossy, DI=Directive, CA=caring, SU=Supportive, PO=Polite, RE=Respectful

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